

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-19 (Cancelled)

20. (Currently amended) A method of identifying compounds that induce dedifferentiation of mesenchymal lineage committed mammalian cells into multipotent mesenchymal stem cells, said method comprising

(a) culturing, in a culture medium, the mesenchymal lineage committed mammalian cells with a test compound suspected of inducing dedifferentiation of the mesenchymal lineage committed mammalian cells for a time sufficient to induce dedifferentiation to multipotent mesenchymal stem cells;

(b) removing the test compound and the culture medium;

(c) culturing cells of step (b) in a first cell differentiation culture medium, wherein the first cell differentiation culture medium induces differentiation of the multipotent mesenchymal stem cells of step (b) into a first mesenchymal lineage cell type;

(d) culturing said cells of step (b) in a second cell differentiation culture medium, wherein the second cell differentiation culture medium induces differentiation of the multipotent mesenchymal stem cells of step (b) into a second mesenchymal lineage cell type;

(e) determining whether the cells of step (b) have undergone differentiation into the first or second cell type, wherein the first and second cell types are different types of cells, wherein induction of differentiation of the cells of step (b) into both the first cell type and the second cell type identifies the test compound as a compound that induces dedifferentiation of mesenchymal lineage committed mammalian cells;

wherein the mesenchymal lineage committed cells are selected from osteoblasts, myoblasts, chondrocytes, and adipocytes;

22 wherein the first and second mesenchymal lineage cell types are selected from
23 osteoblasts, myoblasts, chondrocytes, and adipocytes; and
24 wherein the mesenchymal lineage committed cells are different cell types
25 compared to the first and second mesenchymal lineage cell types.

1 21. (Currently amended) The method of claim 20, wherein the first cell
2 culture medium induces osteogenesis and the second culture medium induces adipogenesis,
3 and wherein the first mesenchymal lineage cell type is an osteoblast and the
4 second mesenchymal lineage cell type is an adipocyte.

1 22. (Original) The method of claim 20, wherein the test compound is a
2 member selected from the group consisting of: substituted purines, pyrimidines, quinazolines,
3 pyrazines, pyrrolopyrimidine, pyrazolopyrimidine, phthalazines, pyridazines, and quinoxalines.

1 23. (Original) The method of claim 20, wherein the test compound is a 2,6
2 disubstituted purine.

1 24. (Original) The method of claim 21, wherein induction of osteogenesis is
2 detected by detecting expression of an osteogenesis marker gene.

1 25. (Original) The method of claim 21, wherein induction of adipogenesis is
2 detected by detecting expression of an adipogenesis marker gene.

1 26. (Currently amended) The method of claim 24, wherein the osteogenesis
2 marker gene is selected from the group consisting of: alkaline phosphatase, collagen type I,
3 osteocalcin, and osteopontin.

1 27. (Currently amended) The method of claim 25, wherein the adipogenesis
2 marker gene is selected from the group consisting of: ~~obese~~ obese (ob) gene, uncoupling
3 protein (Ucp) gene, peroxisome proliferator-activated receptor γ (PPAR γ) gene and
4 CCAAT/enhancer-binding proteins (C/EBPs) genes.

28-34 (Cancelled)